

cm. long; cauline leaves opposite, rarely alternate in specimens mostly from the southern part of the range, deltoid-ovate or ovate-lanceolate; peduncles 3-10 cm. long; flowers usually in true cymes; sepals spreading, rounded, 2.5-4 mm. long; petals 5, yellow, spatulate with a rounded apex, 8 mm. long; achenes in a hemispherical head 3-4 mm. in radius, obovate, 1.5 mm. long, glabrous, beak straight, one-third the length of the body; receptacle short, a little enlarged in fruit.—Mountain meadows, Canadian Zone: Idaho; Blue Mountains, Washington; mountains of Oregon; Siskiyou County, California, southward to the Sierra Nevada in Butte County. Type collection: "Mountains of Oregon." Eagle Creek, Wallowa Mountains, *Cusick* 1161. (cf. *Pittonia* 3: 14. 1896.) California specimens: Dead Horse Canyon, Siskiyou County, *M. S. Baker* in 1899; Colby, *Austin* 180; Jonesville, *Babbett* in 1923.

THE BOTANICAL EXPLORERS OF CALIFORNIA.—X.

WILLIS LINN JEPSON

Rachel Merritt Austin

A small group of naturalists lived in Plumas County in the northern Sierra Nevada of California during the sixties and seventies of the last century. One of these was Rachel M. Austin. Born in Cumberland County, Kentucky, on March 10th, 1832, Rachel Merritt Smith



RACHEL MERRITT AUSTIN

was reared in Platt County, Missouri, and went to a subscription school in the winter. Left an orphan at an early age, removal with her new parents to Illinois gave better opportunities and at sixteen she herself taught school in summer and with the means thus acquired attended the Granville Academy in the winter. At this academy perfectly marvelous subjects were open to the young and eager girl—subjects unheard of in the country school, namely Latin and the natural sciences, including Chemistry, Astronomy and Botany. Here in Illinois she met and married Dr. A. Leonard, a physician, and after his death and the financial crash in 1857 she went to Kansas and there wedded J. T. Austin. With him and her children she came to California, arriving at the gold mines on Black Hawk Creek in Plumas County by means of sleds and snowshoes in 1865. Here the family remained for ten years and then moved to

the neighboring Butterfly Valley, six miles from the county seat town of Quincy. Mrs. Austin began to study the native vegetation in 1866 and continued to collect until about 1900. Early in 1872, she was visited by John Gill Lemmon of Sierra Valley, then a book peddler. Those who knew the exuberant Lemmon will readily credit the story as related by Mrs. Austin. When he saw a small cabinet made from a soap box which Mrs. Austin had filled with minerals, insects and plant specimens, he took off his hat and gave three cheers for the woman who was cooking for miners and at the same time trying to study nature under such adverse circumstances.

This new land was a botanical paradise, revealing a beautiful flora as yet almost unmarred by civilized man and his activities. One of the first plants to attract deep interest was the singular California Pitcher Plant, *Darlingtonia californica*. The residence in Butterfly Valley gave opportunities for special work upon it and the study was continued for many years. Mrs. Austin's experiments upon the nature of the digestive fluid were the first to be made upon this species and have been well summarized by Frank Morton Jones, a specialist on the pitcher liquor of the Sarraceniaceae and its biochemistry. He writes: "Mrs. Austin's letters to W. M. Canby of Wilmington, Delaware, number twenty, and in date extend from Feb. 9, 1875 to March 6, 1877. Some of them are many pages in length, five of them more than a thousand words each, one of about three thousand words. They give in detail her experiments and observations on *Darlingtonia*, with occasional reference to other plants. Most of her observations on *Darlingtonia* seem to have been made without suggestion from others—most were original and first discoveries in regard to that interesting plant. Recognizing its carnivorous nature, her experiments related mainly to its trap structure. She discovered and mapped the distribution of the nectar exudation upon the pitchers, determining that this sometimes took place for two successive seasons upon the same pitcher. She detected the fluid in the bottoms of *closed* pitchers, hence identifying it as a secretion of the plant; determined that it increased greatly in quantity upon the capture of insect prey, which suggested to her the introduction of nutrient matter (such as raw meat) into the pitchers, and she recorded the surprising response in the pouring out by the leaf of a great quantity of fluid. She concluded that the nectar bait had no stupefying qualities and that the pitcher-fluid has no digestive power, but that decomposition rather than digestion takes place in the pitchers. By necessarily crude experiments, she determined that under some circumstances absorption takes place in the pitcher cavity. By sitting among the plants through the rare event of a summer thunder-shower, she confirmed her belief that the entrance of rain-water is precluded by the pitcher structure. She was highly elated by the discovery that the age of an individual plant may be determined, by counting the leaf-base attached to the rhizome. She made prolonged observations upon the pollenizing insects; and especially upon the dipterous larvae which inhabit the pitchers, feeding upon the captured insects. Her observations began before she had any literature whatever in

regard to insectivorous plants; and not until 1875 did she have even a hand lens, her letter of March 22 of that year requesting that Mr. Canby send her one. On *Drosera*, too, she made interesting original observations, and in one of her letters I find the statement that 'My notes on *Drosera rotundifolia* were published in our county paper.' This was in 1875 or earlier. Mrs. M. A. Hail, her daughter, has given me a lead-pencil note of her mother's observations upon this plant, which includes one curious motion of the leaf which, Dr. J. M. Macfarlane tells me, has been recorded for *Dionaea* but never for *Drosera*."

There was also some contemporaneous reference to these experiments. Asa Gray in *Darwiniana*, page 330, gave Mrs. Austin credit for having made "the principal observations upon this pitcher plant." Brief notes by Mrs. Austin herself appeared in the *Botanical Gazette* (3: 70-71, 91,—1878), while Mary E. P. Ames in the *California Horticulturist and Floral Magazine* (10:225-229,—1880) reports something of the work in Butterfly Valley and the demonstration of the response of the pitchers to the introduction of nutrient matter.

It was chiefly in the neighborhood of her places of residence that collections were made of the native plants. The family lived in Butterfly Valley from 1873 to 1878. In 1878 a move was made to Big Meadows, where came William M. Canby, of Wilmington, to see this Sierran botanist on account of her work on *Darlingtonia*. About 1881 another move was made to Davis Creek, Modoc County, where the family remained for about thirty years. An abounding vitality characterized this woman and the frontier was much to her liking. Putting a collecting press on her back she started off on foot into the wilds with a botanical pick, making many discoveries of new plants, as well as laying the foundations by herbarium specimens for a knowledge of the flora of northeastern California. In the mountain forests of Plumas County she was the first to collect a remarkable white saprophyte, the strange orchid *Cephalanthera Austinae* (Gray) Hel. In her honor was also named *Lomatium Austinae* C. & R.

In the school days at Granville Academy Mrs. Austin had taken an especial interest in human physiology, an acquirement which was strengthened by her marriage to the physician, Dr. Leonard. Such training as this was fortified by strong sense and by natural gifts, so that she became in the wide wilderness of the Modocs an informal physician to the scattered settlers who had no regular medical aid. It is still told in the county that on the occasion of a typhoid epidemic she cared for fourteen sick persons and lost not one.

It may well be said of her that she was more than an admirer of the beauty of the native flowers. The temper of her mind and the nature of her education gave the power of scientific thinking, cautious, restrained and reasoned, as any one may see who reads her brief article on *Sarcodes sanguinea* (*Bot. Gaz.* 8:284-285) or her equally brief notes on *Darlingtonia*. That she was valued by botanists as a collector and observer is attested by her correspondence, wherein are found letters from Sir Joseph Hooker, Asa Gray, E. L. Greene, D. C. Eaton, Sereno Watson and several others.

In 1908 she and Mr. Austin moved to Chico and there she died March 14, 1919. The first student and collector of the native plants in Modoc County, an explorer as well in Shasta, Tehama, Plumas and Lassen counties, she also made two expeditions to the southern Cascades in Oregon, everywhere collecting specimens which were distributed to many important herbaria in the United States and Europe. As a pioneer woman botanist of early day California she is the finest and most outstanding type.

Lorenzo Dow Jared

In the extreme interior of San Luis Obispo County, L. Jared discovered some forty years ago a singular *Lepidium* which was named *Lepidium Jaredii* in his honor by T. S. Brandegee (*Zoe* 4:398,—1894). It is the rarest of California *Lepidiums*, and is one of many interesting plants gathered in the region by L. Jared. He lived on the Estrella plain of San Luis Obispo County and after many years' study made a list of the native plants of the region which is the first list for any part of that wide interior and is still in existence in manuscript.



LORENZO DOW JARED

He was born near Abingdon in Illinois on August 6, 1832, and entered Prairie College, which later became Knox College, as a freshman in 1853. He took the regular classical course and was a student of Latin, Greek, Mathematics and Philosophy. Afterwards he became a medical student in New York City, but took his M.D. degree on January 30, 1857, at the Eclectic Medical College in Cincinnati. In the closing year, 1865, of the Civil War, he served as assistant surgeon to the Twenty-third Illinois Regiment. He came to California in 1870 and settled at Los Angeles, later moving to Santa Barbara County. The novel native plants which he sent to Asa Gray during this period are occasionally noticed in the *Synoptical Flora*. From about 1883 to 1894 he lived at Estrella. While resident here he wrote a series of articles on uses of the native plants for the San Luis Press, a newspaper at San Luis Obispo. *Peucedanum Jaredii* and *Navarretia Jaredii* from San Luis Obispo County were named for him by Alice Eastwood (*Zoe*, 5:88-89). He died August 3, 1909.